

## **CLAIMS**

What is claimed is:

1. A device for augmenting, repairing or replacing an intervertebral disc, or any portion thereof, said device comprising at least one piece of natural tissue sized and configured for insertion within an intervertebral disc.
2. The device of claim 1 wherein the natural tissue comprises a biological tissue or a matrix derived from a biological tissue.
3. The device of claim 1 wherein the natural tissue comprises pericardium tissue.
4. The device of claim 1 wherein the natural tissue comprises small intestine submucosa.
5. The device of claim 1 wherein the configuration comprises a plurality of layers of the natural tissue.
6. The device of claim 5 wherein the plurality of layers have a form selected from the group consisting of a roll, a plurality of stacked sheets, and a folded-over single sheet.
7. The device of claim 5 wherein the device further comprises a securement mechanism for affixing together at least a portion of at least two of the plurality of layers.
8. The device of claim 7 wherein the securement mechanism comprises a mechanism selected from the group consisting of a suture, a staple, etc.
9. The device of claim 1 wherein the natural tissue comprises a plurality of sub-units.

10. The device of claim 9, and further comprising at least one securement mechanism for movably interconnecting the plurality of sub-units.

11. The device of claim 10 wherein the securement mechanism comprises a mechanism selected from the group consisting of a suture, a staple, a sheet, a strip.

12. The device of claim 1 wherein said device comprises braided natural tissue.

13. A device for augmenting, repairing or replacing an intervertebral disc, or any portion thereof, said device comprising a plurality of sub-units of a natural tissue having a configuration sized for positioning within an intervertebral disc; and at least one securement mechanism for interconnecting the plurality of sub-units.

14. The device of claim 13 wherein said sub-units each comprise a roll or plug of natural tissue.

15. The device of claim 13 wherein said sub-units comprise braided natural tissue.

16. A method of augmenting, repairing or replacing all or part of an intervertebral disc, said method comprising implanting in the intervertebral disc an intervertebral disc device comprising at least one piece of natural tissue sized and configured for insertion within an intervertebral disc.

17. The method of claim 16 wherein said natural tissue comprises a biological tissue or a matrix derived from a biological tissue.

18. The method of claim 16 wherein said natural tissue comprises pericardium tissue.

19. The method of claim 16 wherein said natural tissue comprises small intestine submucosa.

20. The method of claim 16 wherein said intervertebral disc device comprises a plurality of layers of the natural tissue.

21. The method of claim 20 wherein the plurality of layers has a form selected from the group consisting of a roll, a plurality of stacked sheets, and a folded-over single sheet.

22. The method of claim 16 wherein said intervertebral disc device further comprises a securement mechanism for affixing together at least a portion of at least two of the plurality of layers.

23. The method of claim 22 wherein the securement mechanism comprises a mechanism selected from the group consisting of a suture, a staple, etc.

24. The method of claim 16 wherein said intervertebral disc device comprises a plurality of sub-units.

25. The method of claim 24, and further comprising at least one securement mechanism for movably interconnecting the plurality of sub-units.

26. The method of claim 25 wherein the securement mechanism comprises a mechanism selected from the group consisting of a suture, a staple, a sheet, a strip.

27. The method of claim 16 wherein said intervertebral disc device comprises braided natural tissue.

28. The method of claim 27 wherein said intervertebral disc device comprises a plurality of sub-units of a natural tissue having a configuration sized for positioning

within an intervertebral disc; and at least one securement mechanism for interconnecting the plurality of sub-units.

29. The method of claim 16 wherein said intervertebral disc device comprises a series of relatively narrow plug segments that may be folded together to provide a relatively wider plug of tissue.

30. The method of claim 17 wherein said series of relatively narrow plug segments are held together by a retaining clip when folded together to form a relatively wider plug of tissue.

31. A structure for augmenting, repairing or replacing an anatomical structure, said structure comprising braided natural tissue.

32. The structure of claim 31 wherein the braided natural tissue comprises pericardium tissue.

33. The structure of claim 31 wherein the braided natural tissue comprises small intestine submucosa.

34. The structure of claim 31 wherein the braided natural tissue comprises at least three strands of braided tissue.

35. The structure of claim 31, wherein the braided natural tissue additionally comprises means for attaching the structure to bone.

36. A device for augmenting, repairing or replacing an anatomical structure, said device comprising a length of braided natural tissue, wherein said length of braided natural tissue has a first, straightened configuration and a second, folded configuration, wherein said first, straightened configuration presents a first cross-sectional size and

said second, folded configuration presents a second cross-sectional size, wherein said first cross-sectional size is smaller than said second cross-sectional size.

37. The device of claim 36 wherein said device additionally comprises a drawstring for folding said length of braided natural tissue to its second, folded configuration.

38. The device of claim 36 wherein said drawstring is attached to said length of braided natural material in a manner to facilitate folding the device to a second, folded configuration having at least two folds.

39. A device for augmenting, repairing or replacing an anatomical structure, said device comprising a length of natural tissue, wherein said length of natural tissue has a first, straightened configuration and a second, folded configuration, wherein said first, straightened configuration presents a first cross-sectional size and said second, folded configuration presents a second cross-sectional size, wherein said first cross-sectional size is smaller than said second cross-sectional size.

40. The device of claim 39 wherein said device additionally comprises a drawstring for folding said length of natural tissue to its second, folded configuration.

41. The device of claim 40 wherein said drawstring is attached to said length of natural material in a manner to facilitate folding the device to a second, folded configuration having at least two folds.

42. A device for augmenting, repairing or replacing an intervertebral disc nucleus, said device comprising: (a) a braided natural tissue implant having a first end and a second end; and (b) a drawstring secured near the first end of said braided tissue

implant and passing through said implant at a multiplicity of sites from the first end to the second end;

wherein said implant defines a first, straightened configuration in which the implant has a length-to-width ratio of at least 5:1 when said drawstring has an effective length approximately equal to the length of the straightened natural tissue, and

wherein said implant defines a second, folded configuration in which the implant has a length-to-width ratio of less than 5:1 when said drawstring has an effective length less than the length of the straightened natural tissue,

43. The device of claim 42 wherein the natural tissue comprises braided pericardium tissue.

44. The device of claim 42 wherein the natural tissue comprises braided small intestine submucosa.

45. The device of claim 42 wherein said drawstring passes through the braided implant at a multiplicity of sites throughout the length of the implant, with said multiplicity being at least three sites.

46. The device of claim 45 wherein said drawstring passes through at least five sites.

47. The device of claim 46 wherein said drawstring passes through at least ten sites.

48. A method of augmenting, repairing or replacing an intervertebral disc nucleus, said method comprising:

(a) providing a braided natural tissue implant having a first end, a second end, and a drawstring, wherein said drawstring is secured near the first end of said braided

tissue implant and passes through the implant at a multiplicity of sites from the first end to the second end, and wherein said implant defines a first, straightened configuration in which the implant has a length-to-width ratio of at least 5:1 when said drawstring has an effective length approximately equal to the length of the straightened natural tissue;

(b) implanting said straightened implant into an intervertebral disc space; and

(c) causing said braided tissue implant to assume a second, folded configuration in which the implant has a length-to-width ratio of less than 5:1, said causing being accomplished by reducing the effective length of said drawstring.